Planning for the Worst

(Catastrophic Evacuation)

Norfolk's Past History

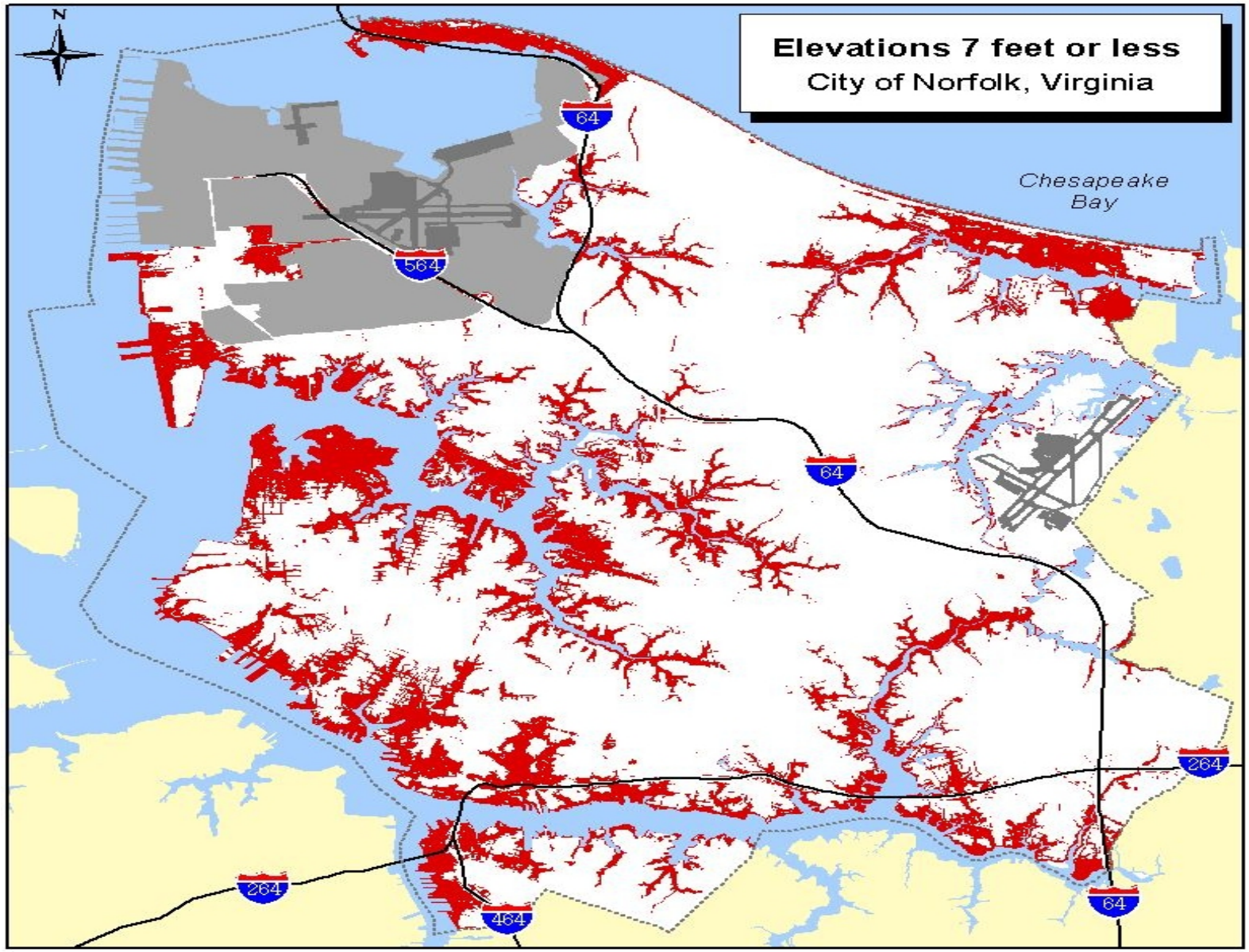
- Prior to the Gulf Coast hurricanes very few plans adequately addressed such catastrophic events.
- Norfolk has not experienced a direct impact from a major hurricane (category 3 or higher) in over 100 years.
- The last hurricane to directly impact Norfolk greater than a category one occurred in 1933 as a minimal category two with sustained winds of 96 MPH and a storm surge of 9.4 feet.

Impact of Isabel

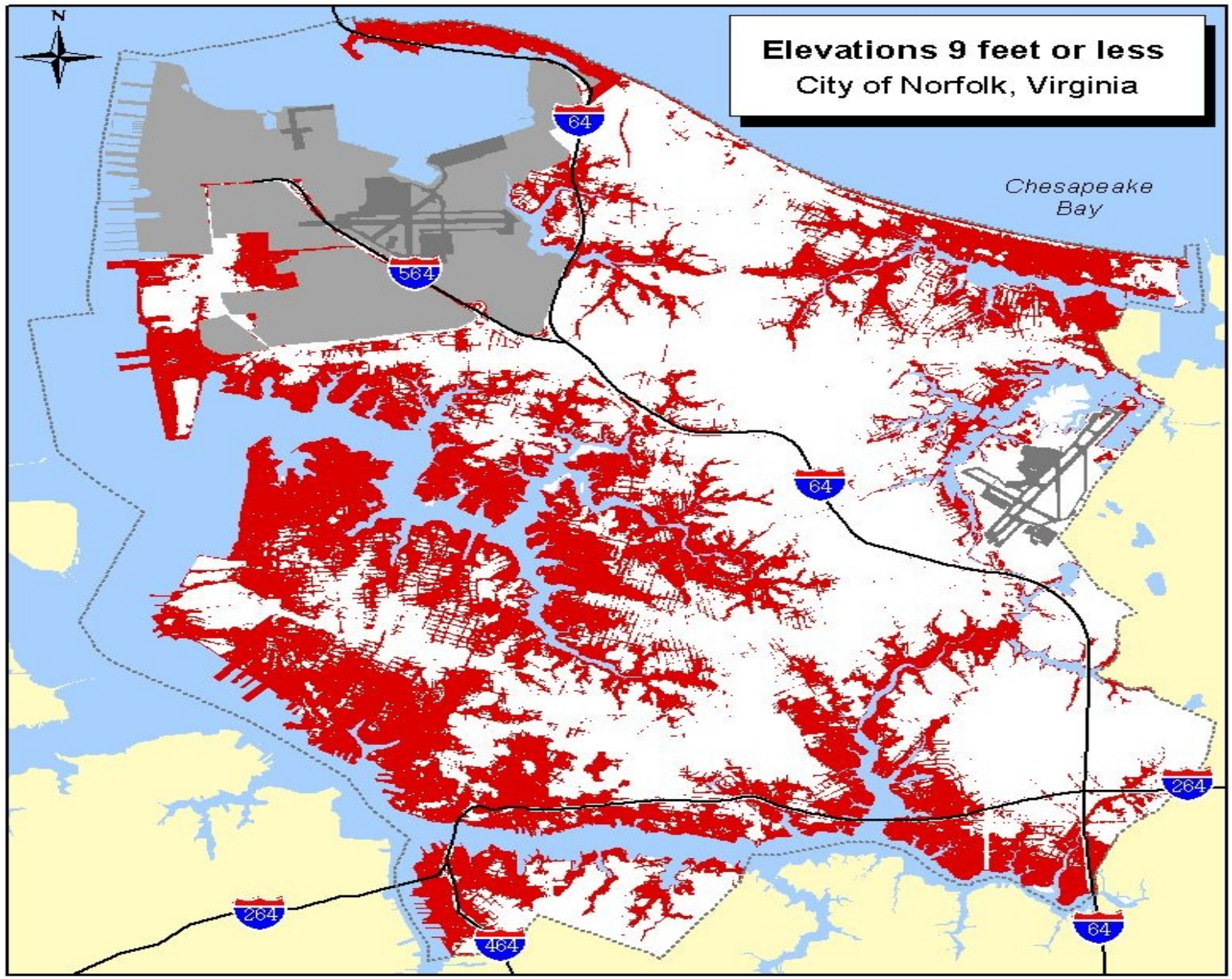
- Over 98% of the city was without power
- 90% of traffic signals were out
- 1,250 people were in Norfolk shelters
- 3 of 4 acute care hospitals were on generator power
- All 54 Schools closed for 7 days due to loss of power
- Damage assessment was in excess of $84 million
- 1,000,000 cubic yards of debris required removal
- 1,642 buildings sustained structural damage
- 17 building were a total loss

For Norfolk Isabel was only a strong tropical storm with sustained winds of 54 MPH and gusts to 75 MPH.

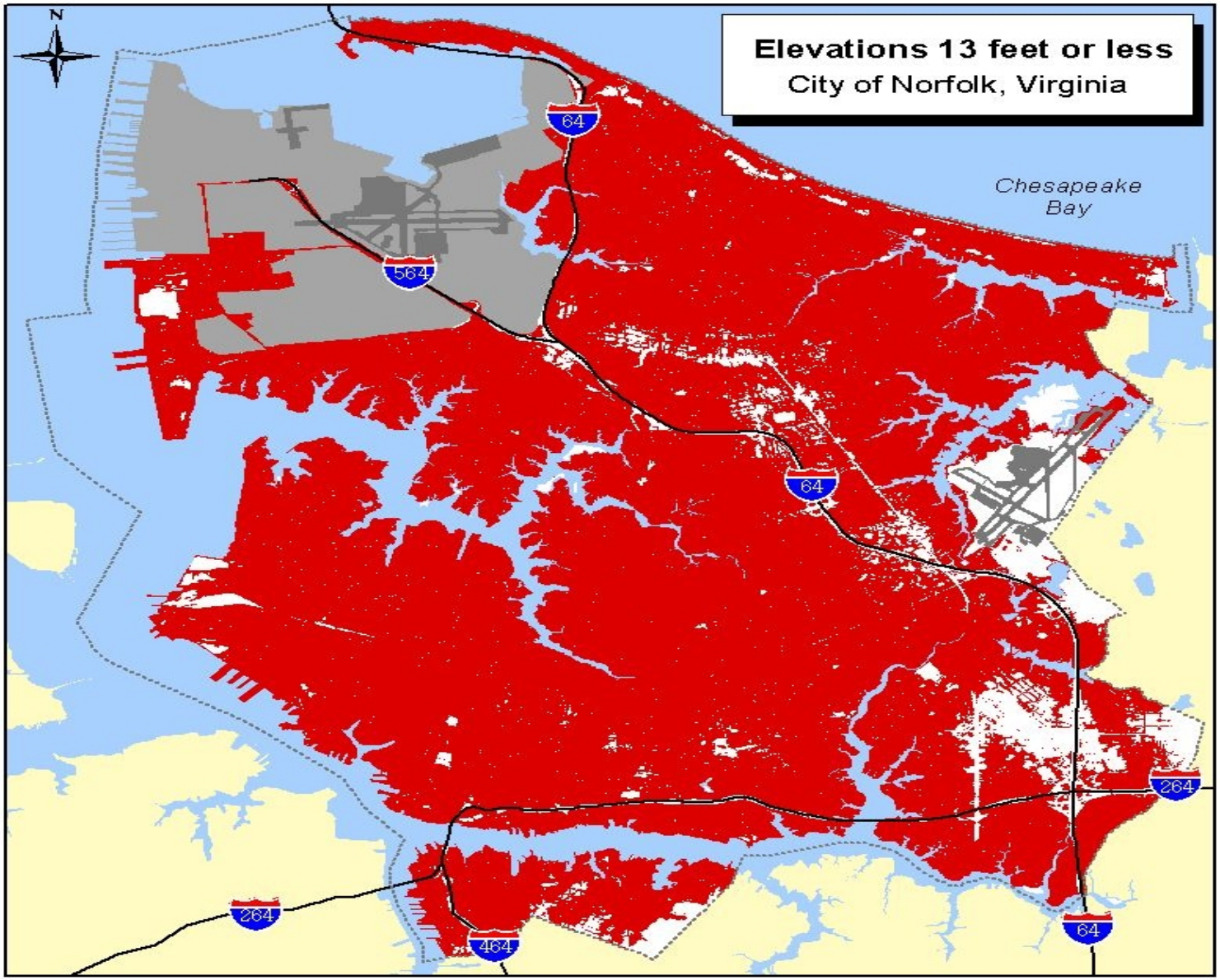
Category 1 Hurricane



Category 2 Hurricane



Category 3 Hurricane



Challenge

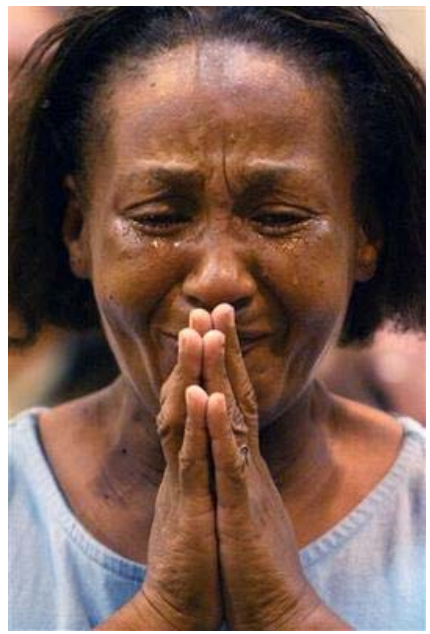
- Develop a safe and efficient process for moving over 240,000 people out of the City as a precaution for or result of a catastrophic event.

Assumptions

- Majority of the 240,000 residents would evacuate under the threat of a major hurricane (Category 3 plus)
- Private vehicles would be the primary means of transportation.
- Approximately 10% - 20% would not or could not evacuate.
- Insufficient capacity to shelter 10% of the population during a major hurricane

Sociology of hurricane evacuations (Reasons people don't evacuate)

- Experience (denial, apathy, fear)
  - No transportation/dependent of public transportation
  - Low income
  - Disabled, elderly, frail
  - Home-bound
  - Medically or chemically dependent
  - Mentally challenged
  - Homeless



Vertical Evacuation Comparison
Norfolk/New Orleans High-Rises

Norfolk Marriott
24 stories – 405 Rooms
IRC Building Code to 100 MPH

New Orleans Hyatt
26 Stories – 520 Rooms
IRC Building Code to 140 MPH

Identifying “At-Risk”

- Accurate residential data and statistics are not easily obtained or shared.
- Block Captains are gathering “at- risk population data in their neighborhoods.
- Utilization of CERT and community leaders to train neighborhoods in preparedness.

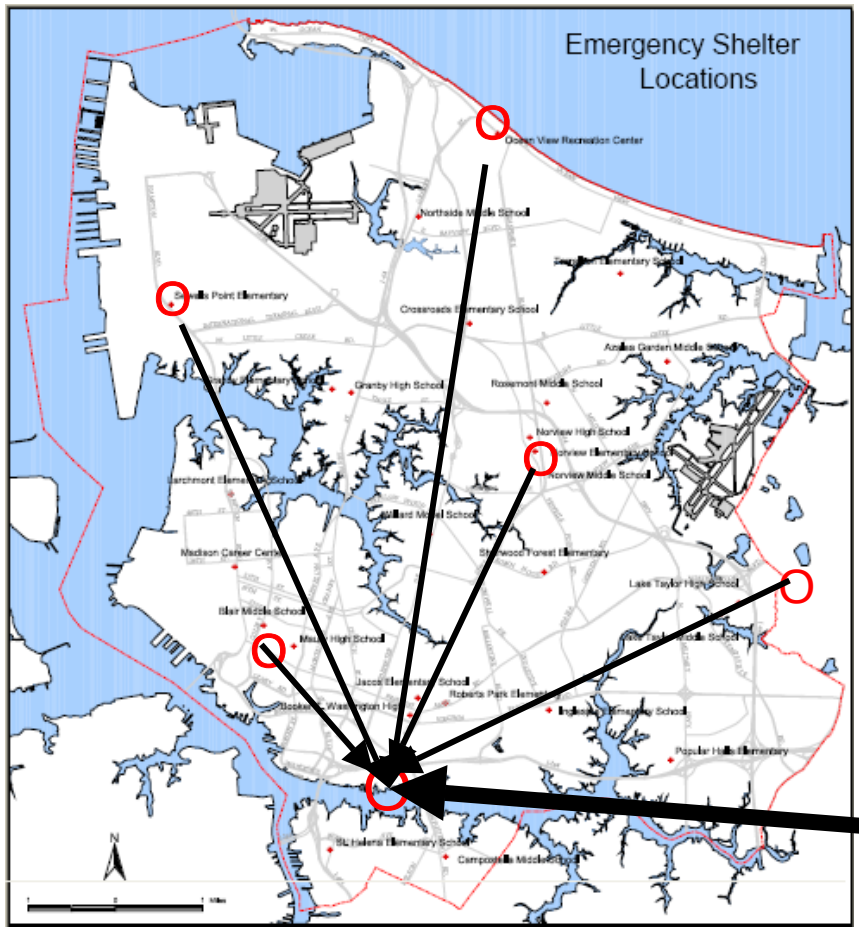
Evacuation or relocating by foot to Pick-Up sites

Pick-up sites would be established throughout the city and citizens would be advised to walk to these sites for transport to other pre-selected staging areas for out of city transport.

Pick-up site locations would be disseminated to the public via media and designated on a city map by a O.

Mass transit will relocate persons from pick-up sites to staging points.

Vehicle Relocation from Pick-up Sites to staging areas



Various vehicles such as HRT and School Buses would be used to transport citizens from pick-up points to the main staging area at Harbor Park.

All Modes of Transportation must be carefully examined

Foot

Vehicle

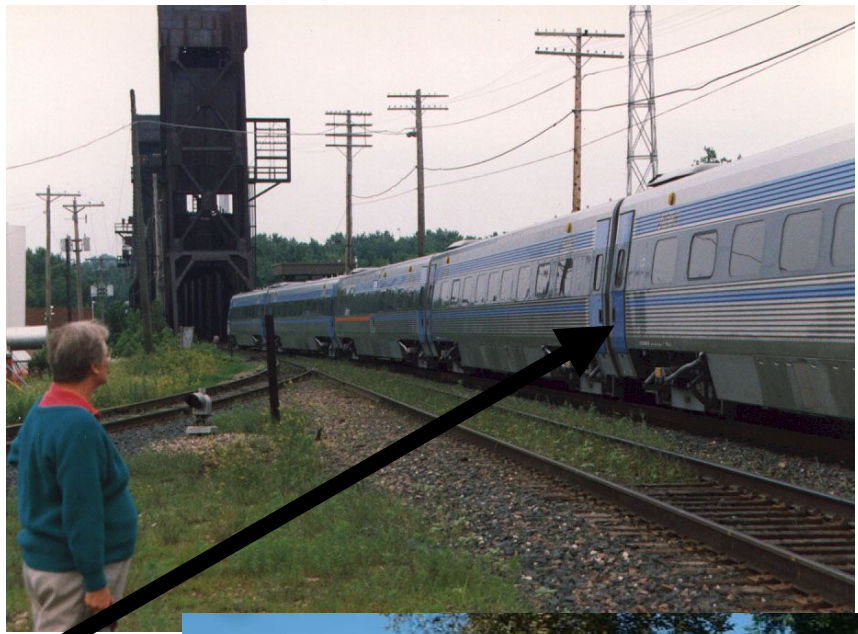
Sea

Air

Rail

Staging for alternate transportation

Harbor Park would be the receiving and debarking staging facility in Norfolk for transport out of the danger zones.



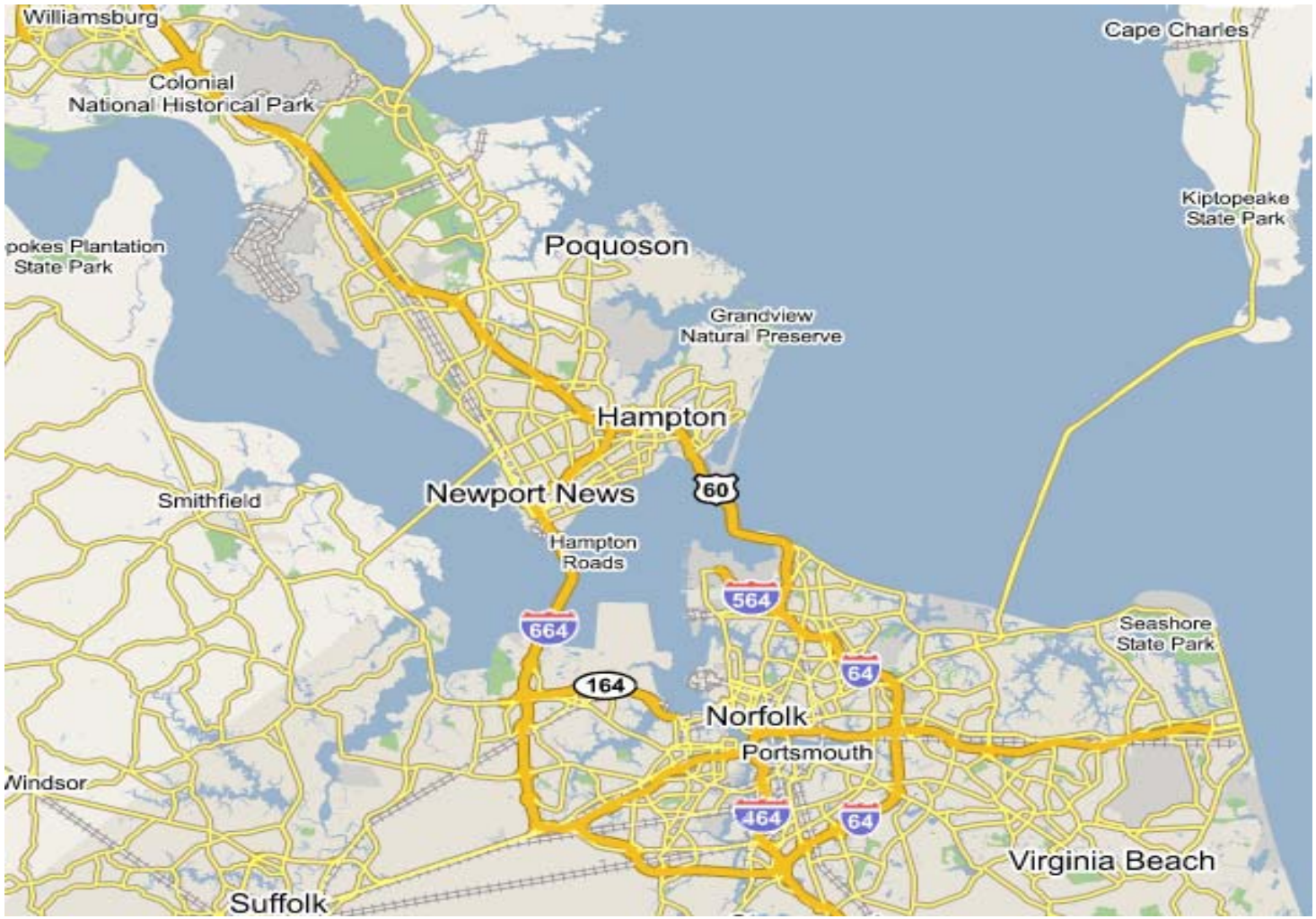
Some Tunnels have Flood Gates

If the Flood Gates are not closed timely, the facility is in peril of flooding. Approximately 2 hours are needed to close gates.

The Hampton Roads Bridge Tunnel has flood gates on both ends of both tubes and the Mid-Town Tunnel has gates on the Norfolk side only.

Norfolk Mid-Town Tunnel flooded as a result of Hurricane Isabel.

Norfolk Highway Network



Traffic Cameras & Alerts

HAMPTONROADS.COM/PILOT ONLINE

Ten (10) Potential areas of traffic slow-down or heavy congestion.

A. Monitor Merrimac Bridge/Tunnel

B. Hampton Roads Bridge/Tunnel

C. Downtown Tunnel

D. Mid-Town Tunnel

E. Chesapeake Bay Bridge/Tunnel

F. James River Bridge

G. Coleman Bridge (Toll)

H. Berkley Bridge

I. High Rise Bridge

J. Chesapeake Expressway (Toll)

Several Bridge/Tunnel Complex's

Hampton Roads Bridge Tunnel

Traffic congestion occurs on a daily basis on Interstate 64 and the approach routes to the Hampton Roads Bridge Tunnel Complex.

Accidents occurring at both tunnels can cause significant traffic congestion

February 22, 2006 accidents at both the Hampton Roads and Monitor Merrimac Bridge Tunnels caused traffic back-ups lasting several hours for the major routes (I-64 & I-664) in/out of the Norfolk/Portsmouth area.

If an evacuation were in progress accidents could cause several hour delays on major evacuation routes.

Evacuation by rail

Virginia Railway Express (VRE) serves the area of northern Virginia on two lines, one to Manassas and one to Fredericksburg, both terminating at Union Station in Washington, DC. They began operations in 1992 utilizing GP40 locomotives rebuilt into RP39s, and coaches that were de-motorized Budd Company RDCs from the MBTA. They currently operate push-pull equipment generally consisting of an RP39 locomotive, a cab car and four to six coaches depending on the time of day. In 2000, they began introducing thirteen new Kawasaki bi-level coaches to the fleet of single level passenger cars.

The fleet has 45 bi-level coaches that will hold 157 passengers per coach. Later this year VRE will purchase 11 additional bi-level coaches that will hold 137 passengers each. The system also has 13 single level coaches, each will hold 135 passengers.

VRE System Map

Norfolk served by NS & CSX

Loading without Stations

Bi-Level Coaches?

A Rail Coach will hold an Average 130/150 Passengers

Norfolk Public Schools
Department of Transportation

About Norfolk

- **Norfolk Public Schools operates a fleet of 292 buses**
- **245 contract drivers**
- **Transports 18,897 students**
- **Travels over 3.5 million miles annually.**

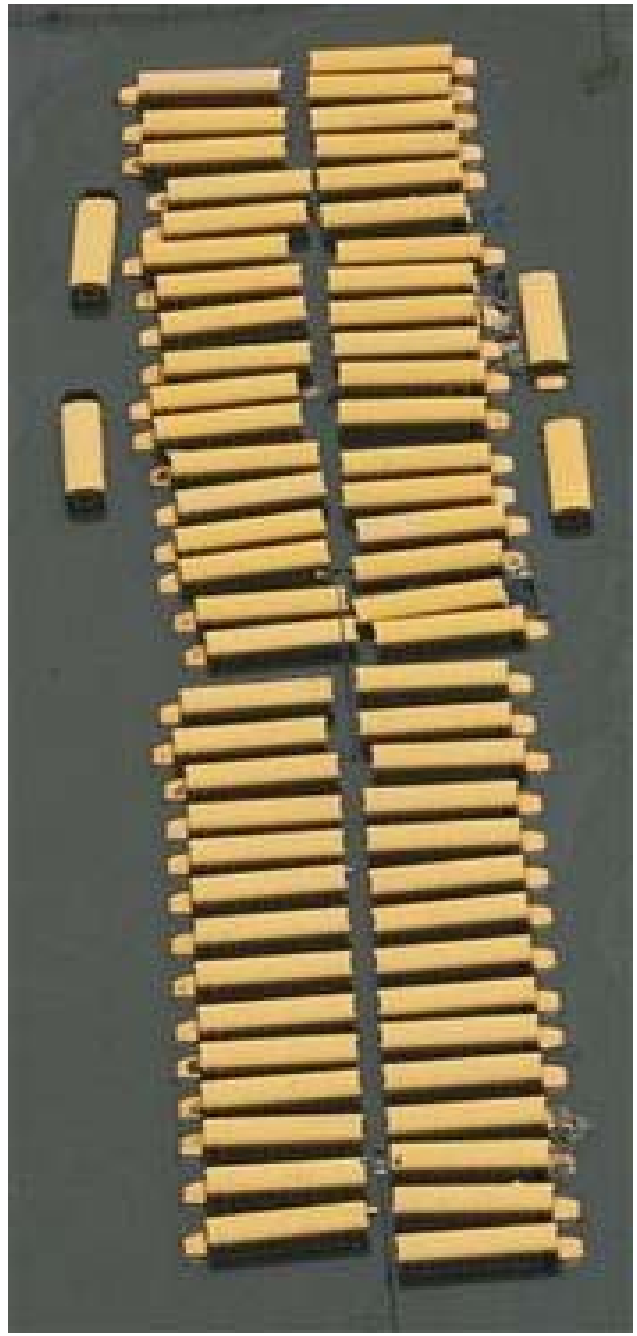
Hampton Roads Transit (HRT)

- Serves the cities of Norfolk, Virginia Beach, Chesapeake, Portsmouth, Hampton, Newport News, and Suffolk.

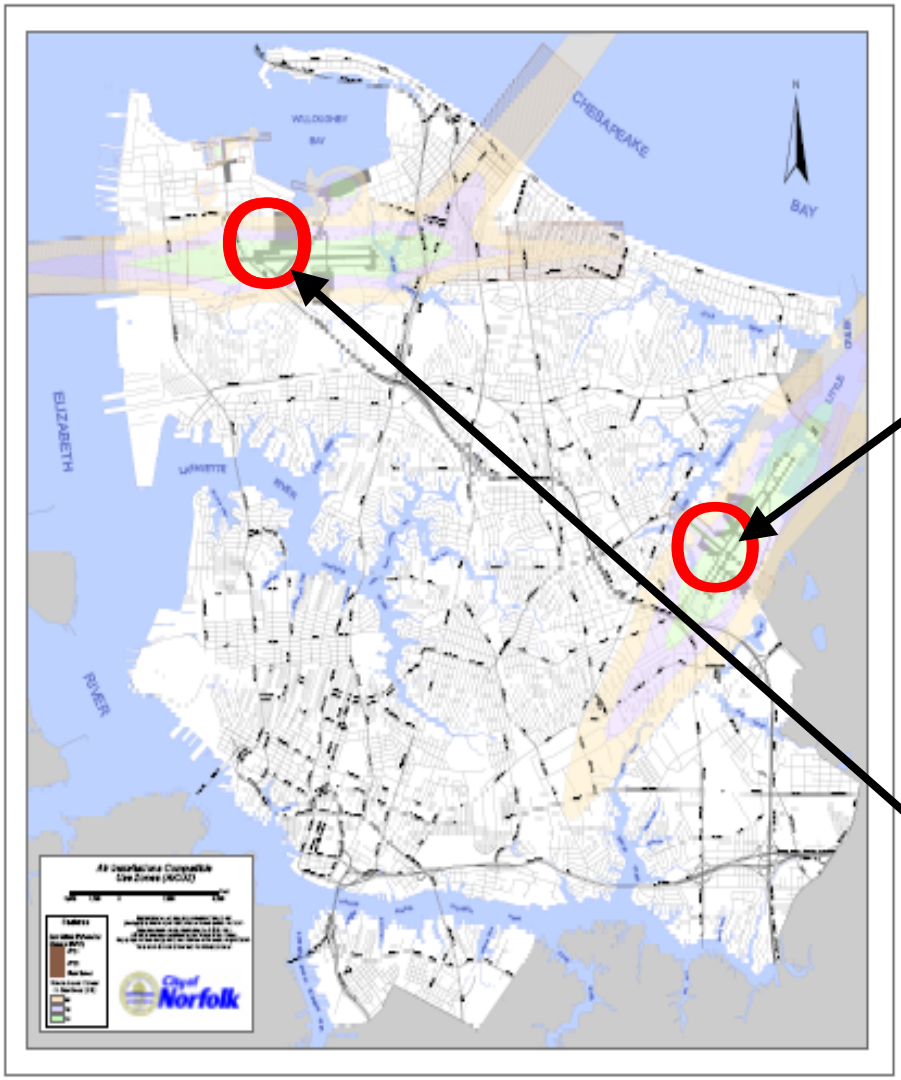
- Total of 489 full-time, part time and seasonal drivers.
- Total of 341 buses with an average seating capacity of 43 seated, and 21 standing
- 319 of the 341 are ADA accessible

Advanced Planning

- **Plan for drivers and several layers of back-up drivers.**
- **Work out the logistics for staging and rotation of school buses throughout the city.**
- **Safeguard both resources and personnel.**



Evacuation by Air



Norfolk has TWO major Airports,

Norfolk International Airport

Naval Station Norfolk

Air Capacity

Commercial aircraft could be used for evacuation with each aircraft holding 100+ passengers depending on size and make of aircraft. Norfolk currently handles approximately 5,200 passengers per day.

Norfolk International Airport has 7 commercial airlines plus Airborne, Fed-Ex, UPS

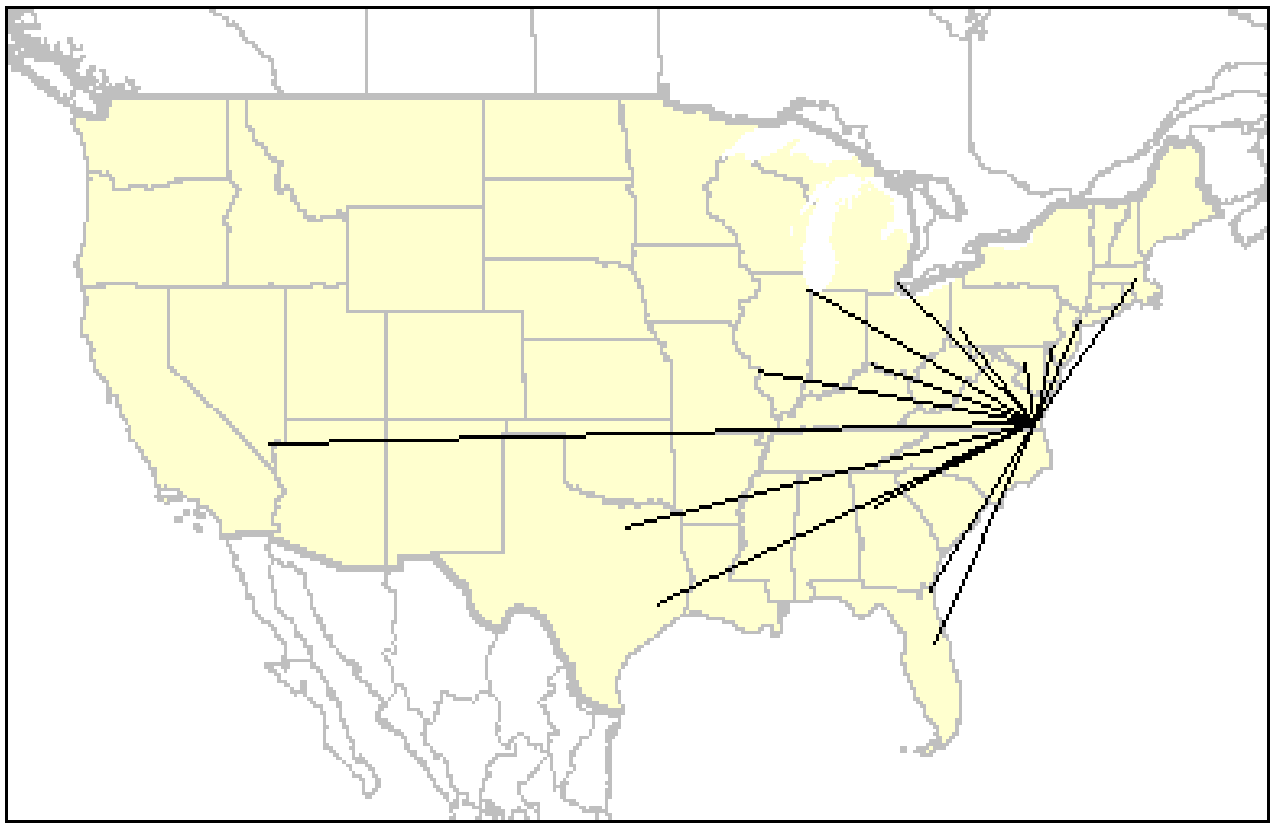
Military transports depending on the size, configuration and aircraft model could hold various passengers, cargo, equipment, and medically or mobile dependent persons.

Chambers Field could handle up to 100 flights per day.

Military Aircraft could be used for Special Needs citizens

Norfolk Air Lift Relocation Sites

Norfolk, Virginia is within two hours flying times of several major airports.



Water Evacuation/Relocation

Norfolk is located along the Mid-Atlantic coast and has direct access to the Inter-coastal Waterway, Chesapeake Bay and the Atlantic Ocean.

Evacuation/Relocation via ship would be challenging however with proper planning and logistics movement of citizens via ship could be achieved.

Water Evacuation Potentials

Norfolk has several miles of waterfront which could be used to dock ships and load passengers. Some of the larger cruise ships can hold in excess of 3,000+ people.

Norfolk has one of the largest concentration of Naval vessels in the world. Over 80 ships are home ported in Norfolk. Passenger Capacity could be in the thousands.

Hampton Roads Transit (HRT) is the region's **public transportation system,** providing routes and connections within and between the cities of **Norfolk, Virginia Beach, Chesapeake, Portsmouth, Hampton, Newport News, and Suffolk**.

HRT fleet:

- 341 Total buses with average seating of 43
- 319 if the 341 are handicap / ADA accessible
- Total drivers 409 full time – 68 Part Time – 12 Seasonal

Hampton Roads has 24 Charter Bus Companies with approximately 150 Coaches.

1. Newton Bus Service, Inc
2. Admiral Coach Tours
3. Agape Tours
4. American Bus Line
5. Atlantic Coach
6. Auto Rent
7. Banks Charter Bus Line
8. Carolina Trailways
9. Charter Bus Service Company
10. Coach Blizzard Tours
11. Ed & Son Bus Service
12. Fun Tours
13. Gaines Bus Service
14. Hound Dog Bus Service
15. J & D Tennessee Tours
16. Jacobs Bus Company
17. James Bus Service
18. Lassiter's Bus Service
19. Norfolk Motor Coach
20. Pleasure Charters & Tours
21. Promise Land Tours
22. Taylor's Bus Service
23. Tranquest
24. Venture Tours

EVACUATION CHALLENGES

Local (L) Regional (R) State (S) Federal (F)

- Timely evacuation decision making **L, R, S**
- Notification **L, R, S**
- Transportation or lack off **L, R, S, F**
- Documentation of resources and evacuees **L, R, S, F**
- Mass transit coordination, ALL transportation modes (Vehicle, Rail, Air, Sea) **L, R, S, F**
- Identification of drivers and personnel for Mass Transit (school / HRT busses) **L, R, S**
- Re-entry (how do we get the evacuees back that used Mass Transit?) **L, R, S, F**
- Shelters or lack of (Identification of relocation destination / host shelter sites **L, R, S**
- Continuity of Government / employees (emergency coordination number, VDEM) **L, S**
- Regional evacuation coordination decisions **L, R, S**
- Special Needs (Medical, Pets, Apathy, etc.) **L, R, S, F**

QUESTIONS ?